

INSTREAM PROJECT DESIGN CHECKLIST

*For Design and Construction of Flood and Erosion Protection
Facilities and Habitat Restoration Projects that May Include
Large Wood Placement or Natural Wood Recruitment*

Project Name Tukwila 205 Gaco Western Repair

Project Manager Claire Jonson

River/River Mile/Bank Green/15.9 to 15.4/left bank

Date 06/28/2018

Check one or both:

☒ Project includes placement of large wood elements

☒ Project may influence the recruitment, mobility and accumulation of natural large wood.

Note: If the project is comprised of emergency work, then fill out and file this form within 30 days of completion of emergency work.

I. Project Background and Preliminary Design (30-40 Percent) Information

(Provide general information at a conceptual level)

1. Describe the overall river management context, strategy and objectives for the river reach. Refer to pertinent plans, policies or documents pertaining to flood hazards, salmon recovery, etc.

This project will be done in cooperation with the United States Army Corps of Engineers (USACE). The USACE will manage the design and construction of the new facility through the PL84-99 rehabilitation program. As identified in the Interim Green River System Wide Improvement Framework (SWIF), the existing system of levees in this reach do not meet current engineering design standards. The levee slopes are over-steepened and the system is prone to scour and slope instability leaving the lower Green River valley at a higher flood risk than desired. Additionally, current erosion damage along the Gaco Western portion of the Tukwila 205 levee further threatens the levee's stability. Current erosion damages, as identified by the USACE, consist of roughly 600 LF of an over-steepened slope, at approximately 1H:1V. In the current damaged condition, the levee provides a 5-year level of protection (LOP). The Factor of Safety (FOS) value for rapid drawdown and steady state seepage are below the minimal FOS requirements in the USACE manual.

2. Describe the goals and objectives of the project and its relative importance to the success of DNRP program goals and mandates. Identify funding source(s) and describe any applicable requirements or constraints.

The goals and objectives of the project are listed below:

- *Increase the level of flood flow containment along the left bank to the level as defined by the SWIF (500-year level of protection plus 3 feet of freeboard).*
- *Aid the USACE in selection of a flood protection system alternative for final design and construction that balances King County Flood Control District policy directives regarding flood protection, habitat restoration, and recreational use as informed by the SWIF, as well as project site opportunities, constraints, and funding.*
- *Incorporate habitat features including wood design and riparian vegetation necessary for permit approval.*

The local share cost will be established through a Cooperation Agreement between USACE and the King County Flood Control District.

3. Describe the existing (and historic, if relevant) site and reach conditions, including structural features, channel form, and the presence of naturally-deposited large wood. Describe known utilization by salmonids and any important or unique biological or ecological attributes.

The current condition of the shoreline of the project includes the Green River Levee, the Segale Business Park, industrial areas that include impervious surface areas, including Gaco Western and Mitchell Moving and Storage. The bank tree cover in the project area is sparse, and existing non-native vegetation provides little cover for fish.

Salmon habitat in the Lower Green River is degraded compared with historical conditions as a result of land use changes, floodplain development, and river management activities such as channel confinement by levees and revetments, flood control at Howard Hansen Dam, and diversion of the White River so that it no longer flows into the Green River. The highly engineered Lower Green River that resulted from these actions is characterized by confined, armored channels that lack the in-stream geomorphic complexity and floodplain connection needed to create aquatic habitats that support healthy fish populations, including ESA listed species such as Puget Sound chinook salmon, steelhead, and bull trout.

The Lower Green River main stem channel is physically isolated from its floodplain by a series of levees and revetments and hydrologically isolated from the floodplain by both river bed incision and greatly reduced flood elevations. Shoreline and riparian areas lack mature trees, resulting in minimal shade and elevated water temperatures. Existing water temperatures and dissolved oxygen do not meet water quality standards, leading to adverse, sometimes lethal, affects to threatened species; the river is on the Clean Water Act Section 303 (d) list and has a total maximum daily load (TMDL) for water temperature. The lack of riparian trees and shrubs also reduces available food resources for juvenile salmonids.

4. Describe what is known about adjacent land uses and the type, frequency, and seasonality of recreational uses in the project area. Are there nearby trail corridors, schools or parks? What is the source(s) of your information?

The La Pianta LLC is proposing long-term development of up to approximately 14 million square feet in a large-scale, campus setting on approximately 498 contiguous acres located in the City of Tukwila and portions of unincorporated King County and the City of Kent that lie due south of the City. Proposed uses are campus-style office and research environments with an array of commercial, retail, residential, hotel and recreational uses.

The closest school is over two miles away. The paved Green River Trail is on the other side of the river, on the right bank of the Green River. Briscoe Park, owned and maintained by the City of Kent is also located on the other side of the river, on the right bank of the Green River.

River recreational use of this reach of the river is low based on the County's Synthesis of 2013 River Recreation Studies (pg. 31). The full report may be found here <https://your.kingcounty.gov/dnrp/library/2014/kcr2629.pdf> Compared to the other two sections of the Green River studied (upstream at Whitney Bridge RM 41.3, and Auburn-Black Diamond to Isaac Evans Park RM 29.1-33.4), the lower Green River through the project site had much lower numbers of people per day, the highest life vest usage, and the highest use of boats (canoes and kayaks) rather than rafts and inner tubes.

5. If the project includes wood placement, describe the conceptual design of large wood elements of the project, including, if known at this stage in the design, the amount, size, location, orientation, elevation, anchoring techniques, and type of interaction with the river and stream at a range of flows.

Wood components of the project are conceptual at this time; preliminary wood locations will be shown on the 35% design drawings.

6. If the project includes wood placement, what is the intended structural, ecological or hydraulic function of the placed wood? What role does the placed wood have in meeting the project's goals and objectives? Is the project intended to recruit or trap additional large wood that may be floating in the river?

Wood components of the project are conceptual at this time; preliminary wood locations are shown on the 35% design drawings. The large logs will provide shade and cover in shallow water and high flow refugia. They will be stabilized by timber piles, which resist buoyant and hydraulic forces by providing uplift and lateral capacity. Selected logs, primarily logs in the upper layers, will connect the logs to the piles with chain. The density of the logs, the number of piles, and one-directional flow also inhibit log movement. The project is not designed to intentionally trap additional wood floating in the river but it may do so.

7. Is the project likely to affect the recruitment, mobility or accumulation of natural large wood, e.g., by encouraging wood deposition on or near the site or promoting bank erosion that may cause tree toppling? Describe expected site evolution and its potential effects on natural wood dynamics.

There is very little natural large wood in this reach of the Green River and very few trees along the right bank of the river within the project reach so the project is not anticipated to have much effect on wood recruitment or mobility. Eventually (20+ years out) some trees that grow up and die will be recruited.

8. Describe how public safety considerations have been incorporated into the preliminary project design. For placed wood, address each of the considerations:
- Type, frequency, and seasonality of recreational use; As stated above, use of this reach of the river is low based on the County's Synthesis of 2013 River Recreation Studies Compared to the other two sections of the Green River studied (upstream at Whitney Bridge RM 41.3, and Auburn-Black Diamond to Isaac Evans Park RM 29.1-33.4), the lower Green River through the project site had much lower numbers of people per day, the highest life vest usage, and the highest use of boats rather than rafts and inner tubes.*
 - Wood location, positioning, and anchoring techniques; see 35% design drawings for wood location. The large logs will be stabilized by timber piles, which resist buoyant and hydraulic forces by providing uplift and lateral capacity. Selected logs, primarily logs in the upper layers, will connect the logs to the piles with chain.*
 - Maximizing achievement of project goals and objectives while minimizing potential public safety risks; The inclusion of large wood provides multiple functions including cover and high flow refuge for juvenile salmon, promotion of local scour to create pools. Public safety risks have been minimized by not placing wood structures within the main channel, accounting for future channel migration potential is the placement of wood structures in the off-channel habitat areas. Risks will be further minimized during design to avoid wood structures that could strain people at recreational flow rates and be difficult for recreational users to escape.*
 - Use of established and recognized engineering, geological, and ecological expertise. The project team includes an experienced County Engineer, an experienced County Ecologist, and an engineering consultant team with added river and habitat engineering, ecological, and geotechnical design experience. The multidiscipline team is involved in the design and review of the project. The design of this project is consistent with best professional practices and standard of care.*
9. Has the project been reviewed and approved by a Licensed Professional Civil Engineer? Please list other licensed technical staff who have reviewed and provided input on the design (e.g., Licensed Geologist and Licensed Engineering Geologist). Specify the Engineer of Record for the design and any other Licensed Professionals who have sealed their portion of the design plans. Were all reviews and approvals completed?

The project will be reviewed and approved by multiple licensed civil engineers (PEs), within their area of practice. Licensed geologists are also involved with the project. There will be multiple Engineer of Record signing respective sheets of the design drawings based on their area of practice and project role. The USACE will be the lead for the design. A series of reviews and approvals will occur until 100% design is complete when drawings will be signed before construction bidding.

10. Has the project been reviewed and approved by a King County Professional Ecologist (e.g., person with an advanced degree in aquatic and/or biological sciences from an accredited university or equivalent level of experience) if ecological benefits are an intended project objective, to evaluate the consistency of the design with project goals, existing environmental policies and regulations, and expected or known permit conditions? Specify the Reviewing Ecologist for the project. Was this review and approval completed? What is the anticipated schedule for completing project milestones (30-40% design, final design, major construction/earthmoving) and for soliciting public input)?

Yes, the County's Project Ecologist has reviewed the 35% design plans. Final design is anticipated to be completed by 2018 with construction in 2019 after public process and permitting is completed. The USACE will be the lead for the design.

<u>Claire Jonson</u>	<u>6/28/18</u>
Project Manager	Date
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Supervising Engineer, Project Supervisor or Unit Manager	Date